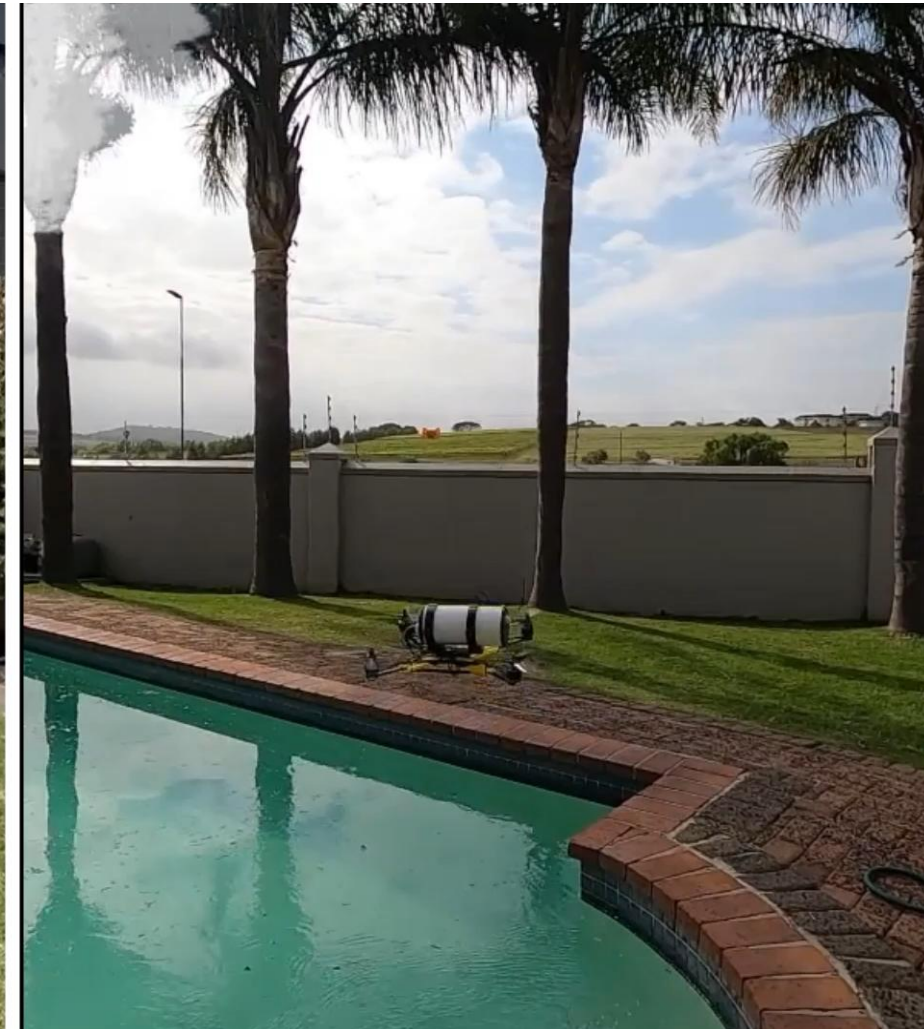


# Rethinking what Quadcopters Can Do: New Use Cases and Capabilities

Willie Smit

# A quadcopter that can fly and swim



# Applications for a quadcopter that can fly and swim

- Inspect hulls of sea vessels
- Inspect oil rigs
- Sample whale saliva



# A quadcopter that can spray and wash



# Applications for quadcopter that can spray and wash

- Cleaning windows
- Cleaning PV panels
- Cleaning wind turbines



# Applications for quadcopter that can spray and wash

- Cleaning heliostats
- Sand blasting structures
- Applying curing agent to concrete

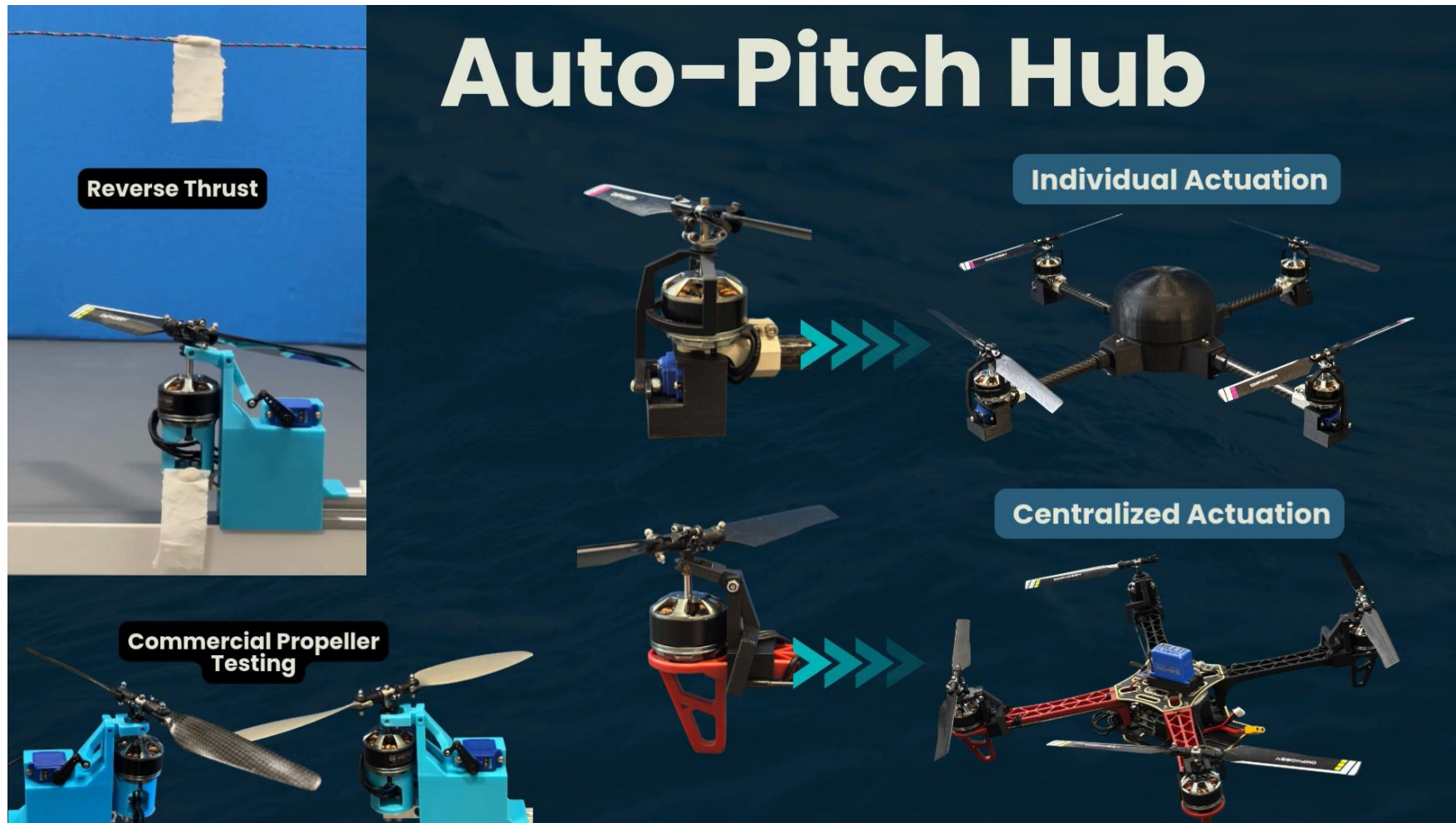


# Applications for quadcopter that can spray and wash

- Sand blasting of structures
- Applying curing agent to concrete



# A variable pitch propeller



# Applications for a variable pitch propeller

Longer flight times for drones:

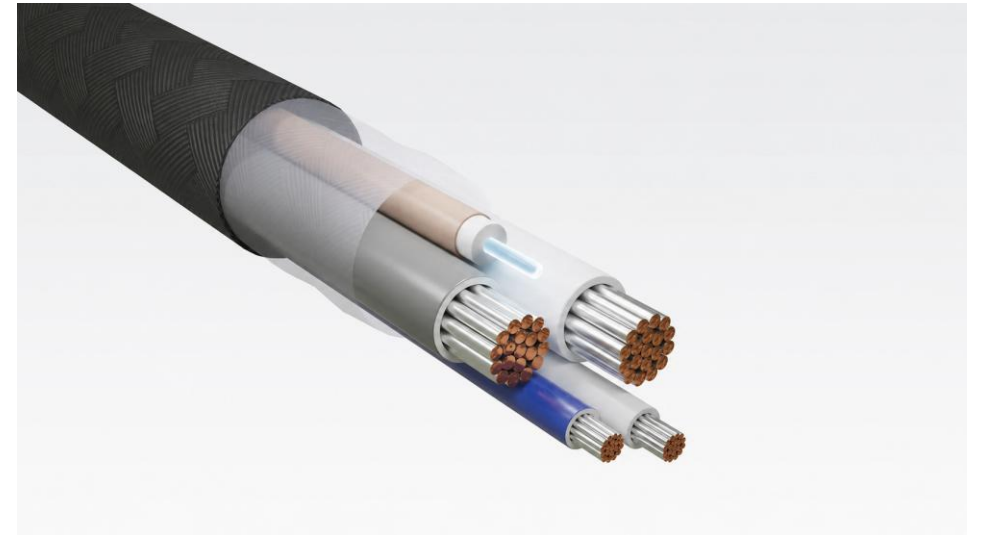
- that fly and swim
- with varying weight during flight
- across varying flight speeds

Faster response to control inputs



# Drone tether

- Ground station supplies power (and pressurized water) to drone
- From 220 VAC to 450 VDC to 50 VDC, 2.8 kW
- Small battery on drone for power fluctuations and emergency landings



# Opportunities

Think of a drone as a long-reach robotic arm.  
Or a sky hook.

We don't have  
all the problems  
yet. Bring us a  
hard one.